# A CASE OF SYRINGOMYELIA.

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UPON the invitation of your secretary to read a paper before this Section, the thought occurred to me to report a case of a disease as yet seldom met with in America, although its symptomatology, pathology and diagnosis seem to be well established. To convince one that syringomyelia is more prevalent in Europe than in America, one need but glance at the literature collected by Blocq,[1] or that of Buhl,[2] or even that of Bäumler,[3] and compare the American with the European references. The cases reported by American authors, as far as I can learn, are those of Starr,[4] Upson,[5] Van Gieson,[6] Booth,[7] Jeffries,[8] Wehlau,[9] Shaw,[10] Church, Hawley, Vought,[11] Abbe and Coley.[12]

Whether this disease is actually as uncommon as reports seem to indicate, or whether it has been overlooked and placed in the category of those affections which it so closely resembles, is a question to be solved in the future. To be sure its symptomatology is so intimately allied with progressive muscular atrophy, the first stages of amyotrophic lateral sclerosis, Morvan's disease, anæsthetic leprosy, some forms of hysteria, etc., that a most thorough examination is necessary before it can be detected. On the other hand, whereas all symptoms may point toward syringomyelia, yet cases are on record where the autopsy revealed an altogether different lesion. It is, therefore, a rather difficult affection to diagnose, and once diagnosed, it is still more difficult to have the diagnosis verified or certified to by the pathologist.

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[1] Gazette des Hôpitaux, Dec. 7, 1889.

[2] Archiv f. gen. de Méd., July 1, 1889.

[3] Deutsch. Archiv. f. klin. Med., B. xl., p. 443, 1886.

[4] Am. Journal of Medical Sciences, May, 1888, p. 457.

[5] New York Medical Journal, 1889, p. 238.

[6] Journal of Nervous and Mental Disease, July, 1889, p. 393.

[7] New York Medical Record, 1888, p. 236.

[8] Journal of Nervous and Mental Disease, Sept., 1890, p. 568.

[9] New York Medical Record, Dec. 12, 1891, p. 704.

[10] New York Medical Journal, 1890, vol. ii., p. 613.

[11] New York Medical Journal. Nov. 21, 1891.

[12] Journal of Nervous and Mental Disease, July, 1892, p. 512.

It is not my intention to enter into a careful review of the symptomatology and pathology of syringomyelia, for I trust you are all acquainted with these facts,[13] I only wish to report a case and the manner in which I arrived at my diagnosis.

D. J. M., age thirty years; height, 5 feet 7½ inches; weight 140 pounds; complexion dark; constitution large, robust, well developed; habits steady, regular, avoiding all excesses.

*Antecedents.*—His grandparents died of old age. His father died of cancer of the stomach, aged fifty-two. His mother, still living, enjoys good health. He has four brothers and one sister living, and likewise healthy.

*Early History.*—He passed through infancy and adolescence without any serious difficulty save an attack of syphilis which he contracted when nineteen years old. Slight secondary symptoms appeared, which under antisyphilitic treatment disappeared, without any later manifestations. At school he was bright and intelligent, interested himself in sports, and was considered in strength and agility the peer of his comrades.

When twenty years old, then living in Chicago, he went on the lakes as wheelman. Shortly afterward he took to railroading, serving in various capacities, as brakeman, fireman, engineer, etc. In 1886, he passed through a severe attack of "inflammatory rheumatism," "all joints of the body" being implicated. For six months he was unable to do any work. The following year, while braking, he received an injury to the index and middle fingers of the right hand. In December,

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[13] For a thorough study of the symptoms of syringomyelia I would refer you to Prof. Rumpf's paper in Neurologisches Centralblatt, 1889, pp. 185, 222, and 257. For a careful, painstaking microscopical examination of the diseased cord, see Van Gieson's paper in the Journal of Nervous and Mental Disease, *loc. cit.*

1888, he was compelled to stay on his engine fifty-six consecutive hours. Completely exhausted, he left for home, and for several days was unable to leave his bed on account of severe headaches and dull aching pains along the spine. On resuming work some time afterward, he found that his strength was failing him; his arms would give out quickly, and he noticed that he could touch the hot parts of his engine without experiencing any pain. On several occasions his hands became blistered by coming in contact with the hot iron, and yet he was totally ignorant of when and where the burns were received. Soon thereafter he was compelled to stop work, his hands and arms were wasting rapidly, the muscles of the shoulders were in constant twitching, and his gait was becoming labored and unsteady. In August, 1891, after having consulted several physicians who pronounced his case rheumatism, paralysis, wasting of the muscles, etc., he decided to come to Buffalo for treatment.

*Status Præsens.*—I noticed nothing striking about his gait or carriage except that he walked rather cautiously and tried to favor his right hand as much as possible.

*Psyche.*—His mind was free and active; he talked intelligently on all subjects under discussion, and appeared to be very hopeful regarding the outcome of his disease.

*Motility.*—Head and neck: The muscles are well developed and perform their various functions without any disturbance. The movements of the eyeballs are free, unrestricted; the iris reacts to light and accommodation; the tongue shows no deviation on protrusion.

Arms: The right arm is perceptibly weakened, so that the patient has little use of it. He is barely able to flex the forearm, or to extend pronate or supinate the hand. Flexion and extension of the fingers can be accomplished, but he is unable to pick up small objects or to button his clothes with this hand. The muscles about the shoulder joint are also weakened, and on removing his hat is obliged to lower the head to the level of his waist. The little motion which he possesses over the shoulder comes from the levator anguli scapulæ and trapezius.

The left arm is less affected than the right, although it is far from possessing its normal strength. With this arm he is still able to dress himself and attend to his wants, but he complains of it growing gradually weaker.

August 1, 1891.—The dynamometer gives right hand, 42; left hand, 48. Three days later, after the use of electricity, right, 48; left, 50.

December 1, 1891.—Right, 35; left, 40.

March 1, 1892.—Right, 20; left, 30.

*Atrophy.*—The supra and infra spinati, deltoids, muscles of the arm and forearm are markedly atrophied. The interossei, thenar and hypothenar muscles are wasted to a slight degree; the right arm, being the weaker, is naturally more affected than the left.

Measurements made August 1, 1891, show the size of the right and left arm respectively.

| *Left Upper Arm. Circumference.* | *Distance from Acromion.* | *Right Upper Arm. Circumference.* |
|---|---|---|
| 9⅛ in. | 4½ in. | 9½ in. |
| 8⅞ " | 7½ " | 8½ " |
| 8⅞ " | 9¼ " | 8¼ " |
| *Forearm.* | *External Condyle.* | *Forearm.* |
| 9¼ in. | 3 in. | 8⅞ in. |
| 8⅜ " | 6 " | 7¾ " |
| 6⅞ " | 10 " | 6⅝ " |
| *Hand.* | *Tip of Median Finger.* | *Hand.* |
| 8½ in. | 4½ in. | 8⅛ in. |

Circumference of chest 9 in. cephalad of the umbilicus, 32½ in.

December 1, 1891, another series of measurements was made, with the following results:

| *Left Upper Arm. Circumference.* | *Distance from Acromion.* | *Right Upper Arm. Circumference.* |
|---|---|---|
| 9½ in. | 4½ in. | 9¼ in. |
| 8¾ " | 7½ " | 8⅝ " |
| 8⅝ " | 9½ " | 8⅝ " |
| *Forearm.* | *External Condyle.* | *Forearm.* |
| 9 in. | 3 " | 8¾ in. |
| 7⅞ " | 6 " | 7⅝ " |
| 6⅝ " | 10 " | 6¾ " |
| *Hand.* | *Tip of Middle Finger.* | *Hand.* |
| 8¼ in. | 4½ in. | 8⅛ in. |

Circumference of chest 9 in. cephalad of the umbilicus, 32½ in.

Another series of measurements was made on March 1, 1892, which resulted as follows:

| *Left Upper Arm. Circumference.* | *Distance from Acromion.* | *Right Upper Arm. Circumference.* |
|---|---|---|
| 8⅞ in. | 4½ in. | 8¾ in. |
| 8⅛ " | 7½ " | 8 " |
| 8 " | 9½ " | 7⅞ " |
| *Forearm.* | *From External Condyle.* | *Forearm.* |
| 8 in. | 3 in. | 7⅞ in. |
| 6⅞ " | 6 in. | 6¾ " |
| 6 " | 10 " | 5⅞ " |
| *Hand.* | *From Tip of Middle Finger.* | *Hand.* |
| 8 in. | 4½ in. | 7⅞ in. |

The electrical examinations made December 1, 1891, and March 1, 1892, show no qualitative changes whatever; the cathode closure contraction in every instance was short, sharp and quick. The only change was a quantitative one. The anode, 40 c.m., was always placed over the sternum; the cathode employed was Stintzing's normal electrode (3 c.m.). The readings were taken from a Hirschmann galvanometer.

| *Left Side.* | *Galvanic Current.* | *Right Side.* |
|---|---|---|
| 2 ma. | Radial nerve | 2 ma. |
| 1¾ " | Ulnar nerve | 1½ " |
| 3 " | Median nerve (elbow) | 3⅛ " |
| 2¾ " | Median nerve (wrist) | 2¾ " |
| 2¼ " | Deltoid muscle | 2¾ " |
| 1 " | Biceps muscle | 2⅜ " |
| 1¼ " | Supinator longus | 4 " |
| 2½ " | Flexor carp. radialis | 4 " |
| 3 " | Flexor carpi urnaris | 3⅜ " |
| 2¾ " | Flexor pollicis | 3 " |
| 3 " | Opponens pollicis | 3½ " |
| 3 " | Adductor pollicis | 3½ " |
| 3 " | Flexor minimi digiti | 3¼ " |
| 3 (?) " | Dorsal interossei | 2 " |

| *Left Side.* | *Faradic Current.* | *Right Side.* |
|---|---|---|
| 10.5 | Radial nerve | 10.6 |
| 10.6 | Ulnar nerve | 10.5 |
| 9.8 | Median nerve (elbow) | 10.5 |
| 9.5 | Median nerve (wrist) | 9.6 |
| 9.4 | Ulnar nerve (wrist) | 9.4 |
| 12.3 | Biceps muscle | 12. |

| *Left Side.* | *Galvanic Current.* | *Right Side.* |
|---|---|---|
| 11.6 | Supinator longus | 10. |
| 8.8 | Flexor carpi radialis | 8.5 |
| 10.5 | Flexor carpi ulnaris | 10. |
| 9.3 | Flexor pollicis | 8.9 |
| 9.1 | Opponens pollicis | 9.6 |
| 9.2 | Adductor pollicis | 9.1 |
| 8.7 | Flexor minimi digiti. | 9. |
| 8.7 | Dorsal interossei. | 8.7 |

Through some inadvertence the deltoid muscles were not examined. The cathode closure contraction in every case was greater than the anode closure contraction.

The examination made March 1, 1892, under exactly similar conditions as the previous ones, showed no particular change. I will only add here the results obtained with the galvanic current.

| *Left Side.* | | *Right Side.* |
|---|---|---|
| 2¾ ma. | Radial nerve | 1¾ ma. |
| 1⅝ " | Ulnar nerve | 1⅞ " |
| 3½ " | Median nerve (elbow) | 2 " |
| 2¼ " | Median nerve (wrist). | 1¾ " |
| 2 " | Ulnar nerve (wrist). | 1¼ " |
| 3½ " | Deltoid muscle. | 2 " |
| 3½ " | Biceps muscle | 2¼ " |
| 4 " | Supinator longus. | 4 " |
| 4 " | Flexor carpi radialis | 2½ " |
| 3½ " | Flexor carpi ulnaris | 3 " |
| 1½ " | Flexor pollicis. | 2½ " |
| 3 " | Opponens pollicis. | 2½ " |
| 2½ " | Adductor pollicis. | 3 " |
| 3¼ " | Flexor minimi digiti. | 2¾ " |
| 4 " | Dorsal interossei. | 3½ " |

I did not make an electrical examination of the lower extremities, neither did I take any measurements.

*Tendon Reflexes.*—The biceps and triceps tendon reflexes, likewise those of the flexors and extensors of the hands were absent. The patellar and achilles tendon reflexes were markedly exaggerated. Ankle clonus was present on both sides. The superficial reflexes were abolished.

*Fibrillation.*—Fibrillary contractions were present at intervals, especially of the deltoids. It was almost impossible to make a correct reading of the electrical examination of these muscles on this account.

The body and extremities presented nothing worthy of attention; the spine was erect, not painful; genital organs well developed, and the muscles of the legs were hard and well preserved.

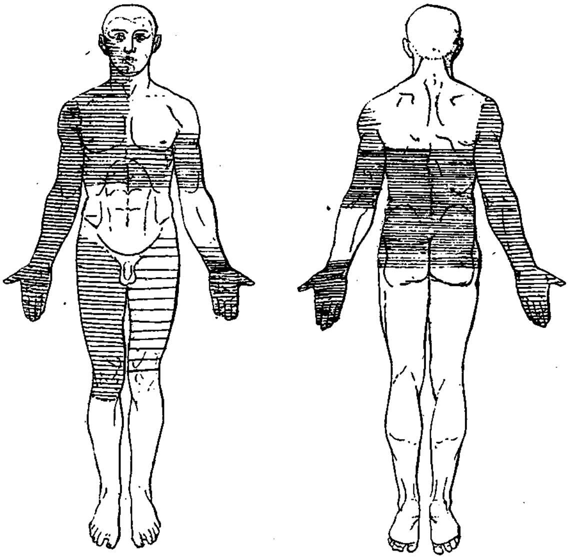
*Sensibility.*—The general or tactile sensibility seemed to be unimpaired. With closed eyes the patient promptly responded whenever the skin was touched, whether by a camel's-hair brush, or a blunt metallic point. He was also able to distinguish between the two. The muscular sense was undisturbed. On seeing some recent scars upon the hands, I asked the patient whence they came, but he could not say. This led me to make a thorough examination of the thermal and pain senses, and suggested to me the probable diagnosis of syringomyelia. The sense of pain and of temperature were diminished over certain areas of the body and extremities. Wherever thermo-anæsthesia existed there also would be found partial or complete analgesia. The only region of the body where this did not hold true was on the back. On the right side from the lower border of the scapula to the thigh there existed analgesia with loss of the sense of heat, while on the left side there was analgesia with loss of the sense of cold. The illustrations will perhaps show the areas of impairment of these senses better than they can be described. (See page 842.)

*Trophic and Vosomotor Disturbances.*—The hands were cold and cyanosed, the skin roughened, presenting here and there a vesicular eruption. The circulation in the hands was sluggish, and injuries healed very slowly, leaving large prominent scars. The palms were continually moist, and this hyperidrosis seemed to affect the whole body, especially the face. The finger nails were thickened, and extremely brittle; the hair covering the hands and arms was long and dense.

There were no painful spots along the course of the various nerves; in fact, no subjective symptoms save a slight numbness about the hands. To ascertain whether the hands were cold or warm, the patient would carry them to his forehead and judge by the sensation of the contact. The joints of the upper and lower extremities were free, painless, and not enlarged. The thoracic and abdominal viscera offered nothing abnormal. The urine was generally acid in reaction, of light specific gravity and contained neither albumen nor sugar.

*Course.*—The course of the disease was rapidly progressive. On first seeing him in August, 1891, he was able to use his left hand as he chose, and could assist with his right. Gradually he lost strength in both hands despite the use of massage, electricity, etc., so that in March, 1892, he could scarcely lift them. This story is perhaps best told by the dynamometer.

In August, 1891, the right hand measured 42, left 48; while in March, 1892, the right measured 20, the left 30.



The ruled portions of the body indicate the presence of thermo-anæsthesia and analgesia. The left leg is only partially affected. The free portions offer no disturbance of these senses.

The eruption and vasomotor disturbances of the hands yielded to the galvanic brush, and when I last saw him his hands were in better condition in this respect than before. The sphincters gradually lost power, although the vesical and anal reflexes seemed to remain intact. The legs, although not appearing to waste, were growing weaker, the gait more spastic, and his general condition poorer, so that in a few weeks he will undoubtedly have to keep his bed. Upon the urgent request of his relatives he returned to his home, and nothing more has been heard from him (March 25, 1892).

If we can judge a disease by its symptoms, and the symptoms are but the outward manifestations of the disease, then the affection known as syringomyelia must be diagnosed by certain characteristic signs and symptoms. Comparing the symptoms of my patient with those mapped out by authors and investigators on this subject, I have no hesitation in pronouncing the case in question one of syringomyelia. The cardinal symptoms as muscular atrophy, thermo-anæsthesia and analgesia, and such secondary symptoms as trophic disorders, scoliosis, and the spastic-paretic gait are all present save one, and that scoliosis. Blocq says that curvature of the spine is an almost constant symptom, and the majority of writers on this subject have found this to be the case. I see nothing in the pathology of syringomyelia that depends upon, or calls forth, a spinal deformity, and hence do not regard it as a necessary adjunct in the symptomatology. Cases offering all of the cardinal symptoms and some of the secondary can scarcely be denied admission into this select circle, just because they lack one of the minor points.

The diagnosis of syringomyelia can be made with a tolerable degree of accuracy if the patient be thoroughly examined, and the differential diagnosis between it and analogous clinical pictures constantly borne in mind. Diseases which have many points in common with syringomyelia are anæsthetic leprosy, Morvan's disease, multiple neuritis, hysteria, muscular atrophy, and amyotrophic lateral sclerosis. Morvan's disease and anæsthetic leprosy are of such rare occurrence in America that the differential diagnosis need not be considered. Hysteria and multiple neuritis, as a rule, have very few symptoms which could be construed as syringomyelia; exceptional cases of hysteria might for a time simulate syringomyelia, but by close watching and careful repeated examinations, the counterfeit will be readily detected. The two affections which offer to the eye an aggregation of symptoms closely resembling syringomyelia are amyotrophic lateral sclerosis, especially in its first stages, and progressive muscular atrophy. The differential diagnosis of these affections as I have met them, ignoring for the present text-book descriptions, may be tabulated as follows.

| | MUSCULAR ATROPHY. | AMYOTROPHIC LATERAL SCLEROSIS. | SYRINGOMYELIA. |
|---|---|---|---|
| Age. . . . . . . . . | 25–35. | 25–35. | 25-35. |
| Sex. . . . . . . . . | Male. | Male. | Male. |
| Onset. . . . . . . . | Gradual. | Gradual. | Gradual. |
| Course. . . . . . . | Progressive. | Progressive. | Progressive. |
| Atrophy, muscular. | Marked. | Marked. | Marked. |
| Tactile sensibility . . | Intact. | Intact. | Intact. |
| Temperature sense. | Normal. | Normal. | Thermo-anæsthesia. |
| Sense of pain. . . . | Normal. | Normal. | Analgesia. |
| Reflexes, tendon . . | Diminished or absent. | Exaggerated. | Exaggerated. |

The similarity of these three affections is quite striking; and in diagnosing a case of syringomyelia, the diagnosis will depend upon the stage of the examination —as progressive muscular atrophy, amyotrophic lateral sclerosis, or syringomyelia.

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## ATROPHY AND HYPERTROPHY OF THE CEREBELLUM.

In the "Annales méd. psych.," 1891, Doursont reviews eight cases, with autopsy, of atrophy of the cerebellum, and five of hypertrophy, and concludes from his work that Gall's theory is utterly unfounded. In one case of atrophy alone was there exaltation in the sexual sphere. Clinical and anatomo-pathological facts tend to prove that the cerebellum gives out impulses of movement and equipoise. In hypertrophy and atrophy alike, equilibrium is equally affected. L. F. B.